DOCUMENT RESUME

ED 249 972 IR 011 416

TITLE	Solutions Unlimited: Evaluation of Prototype Units 1 and 3. Research Report 89.
INSTITUTION	Agency for Instructional Television, Bloomington, Ind.
PUB DATE	Aug 82
NOTE	43p.; For other reports in this series, see IR 011 413-419.
AVAILABLE FROM	Agency for Instructional Technology, Box A, Bloomington, IN 47402 ($2.50 per copy).
PUB TYPE	Reports - Evaluative/Feasibility (142)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	*Computer Assisted Instruction; *Courseware; *Educational Television; Field Studies; Formative Evaluation; Intermediate Grades; *Material Development; Microcomputers; *Problem Solving; School Surveys; *Skill Development; Student Attitudes; Teacher Attitudes
IDENTIFIERS	Apple II; Courseware Evaluation

ABSTRACT

Solutions Unlimited is a computer/video project developed by the Agency for Instructional Television (AIT) in collaboration with a consortium of state, provincial, and local education agencies. The goal of the project is to improve the problem-solving skills of students in grades 6 through 8 through the use of brief instructional television vignettes and related microcomputer courseware. It will include eight lessons, each consisting of a brief video stimulus, a computer program, student worksheets, and a teacher guide. This report details the methods and findings of an extensive field study of prototype materials for lesson 1 ("Hey, Wait! Think, See, So?") and lesson 3 ("Time Management"). A total of 34 target-age students and 5 teachers participated in the evaluation. Synopses summarize the findings, pinpoint problems for each lesson, and offer recommendations for improving the courseware. Appendices include the lesson 3 observation form and teacher questionnaires for both lessons, with results and comments included on the forms. (Author/THC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED249972

Research Report

NUMBER 89

SOLUTIONS UNLIMITED:

EVALUATION OF PROTOTYPE UNITS 1 AND 3

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Roy Morgan
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

agency for instructional television
box a, bloomington, indiana 47402

IR011414

Solutions Unlimited:

EVALUATION OF PROTOTYPE UNITS 1 AND 3

Research Report 89

August 1982

Agency for Instructional Television
Box A
Bloomington, Indiana 47402

The Agency for Instructional Television is a nonprofit American-Canadian organization established in 1973 to strengthen education through television and other technologies. AIT develops joint program projects involving state and provincial agencies, and acquires and distributes a wide variety of television and related print materials available in audiovisual formats. AIT's predecessor organization, National Instructional Television, was founded in 1962. The AIT main offices are in Bloomington, Indiana.

ER011416

TABLE OF CONTENTS

	Page
Introduction	1
Methodology	2
Sample	5
Findings	7
Lesson #1	7
Lesson #3	12
Conclusions	18
Appendix A	20
Appendix B	25
Appendix C	32

Introduction

Solutions Unlimited is a computer video project developed by the Agency for Instructional Television in collaboration with a consortium of 42 state, provincial, and local education agencies. The goal of the project is to improve the problem-solving skills of students in grades six through eight through the use of brief instructional television vignettes and related microcomputer courseware. It will include eight lessons, each consisting of a brief video stimulus, a computer program, student worksheets, and a teacher guide. The eight lessons include:

#1 - Hey, Wait! Think, See, So?

#2 - Communicating with Symbols

#3 - Time Management

#4 - Examining Alternatives and Consequences

#5 - Using Criteria to Judge Information

#6 - Organizing and Presenting Information

#7 - Forming Plausible Explanations

#8 - Making Decisions

At the May, 1983 consortium meeting prototype materials for Lessons 1 and 3 were shared with those in attendance. These two lessons have since been extensively evaluated with students and teachers. This report details the methods and findings of this evaluation.

Methodology

For a perspective on the methodology employed in this evaluation, it's important that the reader realize the purposes for both the prototype materials and the formative evaluation of these materials. "Proto", according to Random House, is from the Greek meaning "earliest form of." Certainly, the prototype materials shared with the consortium and subsequently evaluated with students and teachers were early forms of these materials. But, why share and evaluate early forms of these materials. Several reasons exist. First, throughout the history of the project one of the most difficult factors to conceptualize has been what the actual computer programs will look like. This is in large part due to the fact that few in the project have any experience in transforming "scripts" into computer software. So prototype programs were developed to help consortium and staff alike better conceptualize the computer programs. Second, neither the original production agency, involved in the design and scripting of the two units, nor the final production agency, Decision Development Corporation, was the producer of these prototype materials. Ad hoc production teams were developed to meet the deadlines for these two units. Third, it's important to evaluate the early forms of these materials so that they can be improved. This became the primary purpose of the formative evaluation: to collect information that would help designers and developers improve the materials.

The options for any inquiry are many and varied. Certainly a plethora of methodological alternatives existed for this evaluation; the materials could have been evaluated in actual classroom situations by AIT evaluators, they could have been sent to teachers for their review or for evaluation with their students, they could have been sent to consortium members for their evaluation, or they could have been intensively evaluated with small

groups of students by AIT evaluators. After careful deliberation we decided to:

1) Intensively evaluate the computer portion of the lesson with small groups of students.
2) Seek reviews of the lessons from teachers (who had participated in previous evaluations of earlier project materials).

Although we were interested in improving all of the lessons' materials (teacher's guides, worksheets, etc.), our primary concern at this stage was to improve the computer programs. Toward this end, it was felt that this was the best combination of methodologies to insure timely information that could be used to improve the programs.

For each lesson, AIT evaluators observed groups of 3-5 students as they went through the computer program. The evaluators took detailed notes (see Appendix A for Lesson #3 note-taking form) and occasionally asked questions such as: Why did you do that? What do you think happened? Do you know what you're supposed to do? However, it's interesting to note that extensive questionning was not necessary while students were going through the program since the small groups usually had to talk to one another about strategies as they progressed through the programs. In effect, this resulted in students "thinking out loud." After the program students completed brief questionnaires and discussed their reactions with the evaluators.

It's very important that the role of the evaluator in this process be noted. In this methodology the evaluator becomes the measurement instrument, including instrument administrator, data collector, data analyst, and data interpreter. How in this paradigm are reliability and validity insured? Two reliability and validity checks were built into the design. First, as

previously mentioned, both programs were also independently reviewed by five teachers as AIT evaluators evaluated them with students. We gained increasing confidence in the reliability of the findings through triangulation of the data - multiple sources providing the same results. Secondly, the project team, including the project officer, consultants, and production house functioned as validity checks, based upon their past experience and knowledge of the programs. Finally, the readers of this report, many of whom were exposed to the programs at the consortium meeting, can make their own judgements about the validity of the following findings.

Sample

A total of seven student groups participated in the evaluation of each lesson: three of the groups were visited in their school in Jeffersonville, Indiana, while four of the groups consisted of Bloomington-area students who came to AIT for the evaluation. Each group contained 3-5 students, but for much of the evaluation activity the group, not individual students, was the unit of analysis. The six groups who were visited in their school went through only one of the programs (three groups per program), which was all that was possible in the context of a 45-minute class period. These students were dismissed from a variety of classes (language arts, social studies, and science) and came to the media center to work on the school's computer, an Apple IIe, with the AIT evaluator. The students who came to AIT went through both programs (#3 first, then #1).

Of the total of 34 students who participated in the evaluation, 29% were in grade 6, 35% were in grade 7, and 35% were in grade 8; 60% were male and 40% were female. The overall sample was well-mixed in regards to prior computer usage: 30% reported they had done "a lot" on a computer, 50% reported they had done "a little" on a computer, 20% reported they had done "nothing at all" on a computer. Thus, although relatively small, the student sample contained a diversity of grade levels and prior computer experience.

In addition to the student component of the evaluation, each lesson (computer program and draft teacher guide materials) was reviewed in detail by five teachers including one sixth, two seventh, one eighth, and one K-12 computer specialist. The five teachers have had prior involvement with the project: three were on the pedagogical design team and two had participated in the design evaluation. They represented a

geographical spread including Indiana, Arkansas, Kentucky, Connecticut, and Massachusetts. Since the materials are currently available only on Apple machines, we had to identify teachers who had access to Apples. The teachers were mailed the materials and completed a detailed questionnaire for each lesson.

Findings

The data for both Lessons #1 and #3 were analyzed and reported to the project team (project director, consultants, and producer) within ten days of their collection. For each lesson, a variety of problems were identified based on these data. For each problem that was identified, preliminary recommendations were included in the report to the project team. The problems for each lesson and their attendant recommendations were discussed in detail with the project team and revisions are currently being made in the programs based on these recommendations. The following synopses summarize the findings and pinpoint the problems for each lesson.

Lesson #1

Overall, the program was fairly well-received by both students and teachers (see Appendix B for teacher questionnaire with results). All of the students indicated that they liked the program with 75% indicating they liked it "a lot." The teachers also unanimously indicated that they liked the program and that they thought their students would enjoy doing the program on a computer. However, even though the program was appealing to both students and teachers, several problems were identified. These included:

PROBLEM

A couple of teachers pointed out problems with Disk A. One suggested we need better directions at the end of the disk. Another teacher indicated she didn't feel that Disk A provided adequate feedback to students' responses. Four of the seven student groups went through Disk A (in the three groups that were seen in a school context, there was not time for Disk A.) These four groups were not as enthusiastic about Disk A as they were Disks B and C. However, a key finding is that the three groups who saw neither the video nor Disk A were able to successfully complete the lesson based on the information provided in the directions.

The question now becomes, what to do with Disk A? We should start by examining the assumptions underlying Disk A's development. First, who is it for? If it's for lower-ability level students who have seen the video, perhaps a shorter computer review and more in-class teacher review is appropriate. If Disk A is for students who have not seen the video, then

questions referring directly to the video situation need to be eliminated. It would seem wise to clarify these assumptions prior to making decisions about the Disk. However, based on the available data, it seems there are three possible remedies for Disk A.

RECOMMENDATION

1) Provide an option for using Disk A or not using it, perhaps with a menu.
2) Condense the information. Place some of the review burden on the teacher, with support in the guide.
3) Provide a better transition and/or directions at the end of the disk.

PROBLEM

One teacher wrote, "Wouldn't the guitar borrower know he was moving before the phone call?" This is a basic point in the episode that also seems to be affecting kids' decisions about the volleyball game. Six of the seven groups elected not to play volleyball, probably because the moving away story hook connotes an urgency to return the guitar promptly.

RECOMMENDATION

Make the story hook less final than moving away. Perhaps he simply wants his guitar back to play, but still would like to have it by noon. This would not preclude keeping the branches that have the guitar arriving late.

PROBLEM

Three of the seven student groups had problems the first time they were asked to provide alternatives. Here's what happened:

> Kim's bike chain broke. The computer asks what she should do. Students correctly respond THINK. The computer responds: "Good. Now THINK of some things Kim might do to solve the problem. What is one thing Kim could do?" Some students, who have been typing only one of the steps up to this point, type in SEE or SO. Since the computer asks for three alternatives, students sometimes try SEE or SO more than once.

The problem is the computer accepts these responses, without providing any feedback. It then compares the students' responses to Kim's alternatives. Only then do students realize that they should have typed alternatives instead of problem-solving steps, but it's too late for them to revise their responses.

RECOMMENDATION

At the points in which we are seeking alternatives, if students type a problem-solving step, the computer needs to read the response and give a message to the student that they should be giving alternatives, not one of the steps.

PROBLEM

Also, when the bike chain breaks, the computer asks the students for three alternatives, but it provides only two alternatives for Kim. To be consistent, it would seem wise to ask for and provide the same number of alternatives for both.

RECOMMENDATION

Either ask for only two alternatives, or if we ask for three, have the computer list three alternatives for Kim.

PROBLEM

Again, when the bike chain breaks, the computer asks what Kim should do. At this point five of the seven student groups gave alternative ways for Kim to get to David's house such as WALK, RIDE THE BUS, etc. The computer then comes back with two alternatives for her to do with her bike. When they discover Kim can't fix her bike chain, the computer again asks for alternatives, but this time it really is asking for alternative ways Kim could get to David's. In three groups, kids said: "But we already gave ways for her to get there."

RECOMMENDATION

Re-phrase the first question: "What is one thing Kim could do with her bike." This makes it clear that they must first decide what to do with the bike before deciding how to get to David's.

PROBLEM

Two teachers indicated that when we ask students to compare their alternatives to Kim's, we should list them next to one another. We didn't really see any support for this idea in our observations of the groups; the seven groups we observed all remembered what they had input.

RECOMMENDATION

There is no recommendation on this one. It's probably worth considering the teachers' suggestions even though there was no evidence of a problem from the student evaluation.

PROBLEM

Most of the screens require students to press the space bar prior to advancing the screen. However, a few do not. One teacher cautioned: "Be consistent about the use of self-pacing."

RECOMMENDATION

Be consistent about the use of self-pacing.

PROBLEM

Two teachers indicated some of the screens were too cluttered. As one said, "The amount of print and spacing of it on the screen bothers me." Even though the student sample had lower-ability-level students, they were always in a group that also included average or advanced kids. Therefore, the problem of clutter, which probably most affects slower students, was a little too subtle to discern in observing the groups. However, it's an issue we should carefully consider.

RECOMMENDATION

We should seriously ponder the issue of the amount of information on individual screens.

Most of the following problems were discovered based on multiple, detailed runs through the program, but were not necessarily a result of the student/teacher data.

PROBLEM

It's raining at 10:55. The computer asks, "What should (Kim) do?" If the response is RUN, computer responds: "Good thinking. Kim does need to THINK of some ways to solve her problem." The program has not responded to what was typed.

RECOMMENDATION

Obviously, in this instance, the computer needs to react to the input, RUN, and indicate that a step should be typed.

PROBLEM

Kim reaches the crying child. The computer asks "What would you do?" No matter what the response is, Kim crosses the street. Why ask what they would do if Kim crosses the street anyway, especially when the computer generates a list of alternatives immediately after Kim crosses the street?

RECOMMENDATION

Two options seem reasonable:

1) Drop the question: "What would you do?"
2) Don't ask the question until after Kim has crosses the street. It would then immediately precede the listing of Kim's alternatives.

PROBLEM

It's 12:05. Kim has gotten there late and David has left. She finds the note. The computer then asks for problems Kim has. If two are listed (she must get her bike and she must find David), the computer then says, "And another problem ... the guitar is ruined." However we had elected to cover the guitar; it did not get wet. We tried this three times and it happened each time.

RECOMMENDATION

Two options seem reasonable:

1) Eliminate the statement, "And another problem ... the guitar is ruined." Let students conclude the program by defining their own set of problems.

2) Insure the statement appears only when the guitar has actually gotten wet.

PROBLEMS

A variety of word or punctuation problems were identified by teachers or our runs. These include:

1) Several sentences begin with periods: ". If you believe the volleyball game is no problem for Kim, just press return."
2) Kim arrives at David's at 12:05. The computer says, "So Kim didn't make it by now."
3) At one point the computer reinforces students with, "That's the step, for sure." Do we need "for sure?"
4) After the bike chain breaks, the computer asks: "What is one way ... without a bike." Should be "bike?" (teacher).
5) When students elect to call someone, the computer asks: "Who do you think Kim should call?" Should be "Whom." (teacher).

RECOMMENDATIONS

1) Eliminate all periods at the beginning of sentences.
2) Change "now" to "noon."
3) Drop "for sure."
4) Add the "?" after "What is one way ... without a bike."
5) Change "who" to "whom."

PROBLEM

With it's many branches it could take teachers several hours to preview this program. Realizing this fact, one teacher suggested that we include a map of the various branches in the teacher's guide. The first page of the script for this program is a good start for such a map. The summary of the computer program in the current guide alludes to the many branches, but does not detail them.

RECOMMENDATION

Include a detailed map of the various branches in the teacher's guide so teachers do not have to spend hours previewing the disks.

Lesson #3

Lesson #3 was less appealing to both students and teachers than was lesson #1. Although all students indicated they liked the program, most (65%) indicated they liked it only "a little." Three of the teachers also indicated they liked the program only "a little" and one indicated she didn't like it at all. (See Appendix C for teacher questionnaire with results.)

The program does appear to be meeting a student need. Almost all the students (88%) indicated they sometimes have problems getting everything they need and/or want to do done. The same number (88%), however, indicated they have never made a schedule like the one in the program. Apparently the notion of specifically scheduling blocks of time was foreign to these students, but could prove useful to them as their lives become increasingly complex.

Unfortunately, several portions of the program were not understood by the teachers and students. In fact, the student and teacher data converged to a consistent message: elements of the computer program were confusing. In several instances (both student and teacher) this confusion resulted in subjects not successfully finishing the program by completing a schedule for Monday-Thursday.

First, on what basis do we consider the program confusing? The data sources for this conslusion are both students and teachers. From students we have:

1) Direct observations of the groups. There are points in the program (to be elaborated later) in which each group was not sure what to do.

2) From a list of adjectives that might describe their reactions to the program, almost all students selected "confusing" as one of their adjectives.

From the teachers we have:

1) Four of the five (with the lone dissenter being the one teacher who worked on the pedagogical design for this lesson) teachers indicated the program was not clear and understandable.

2) Three of the five indicated "not many of their students could easily operate it." The other two indicated most of their students could easily operate it, but no one indicated all of their students could easily operate the program.

These are very consistent data. Let's see if we can identify the sources of this confusion.

PROBLEM

The single point in the program that causes consistent confusion is after the schedule for Monday and Tuesday afternoon has been completed. Here's what usually happens:

> The schedule is completely filled in for Monday and Tuesday afternoon. Subjects then look at the list of commands at the bottom of the screen, while debating what to do next. After a while they zero in on N=end (which is a command that has never been previously explained, or even mentioned). They enter N and the computer immediately begins checking their schedule, but based only on Monday and Tuesday. No one, students nor teachers, who did this ever understood what happened (unless we told them).

Two teachers called to ask, "Why does the schedule only go through Monday and Tuesday?" Another teacher wrote: "When scheduling, I only worked on two days to insert information. Did I miss something?" Obviously, those who make this mistake (which was the majority of our small sample) miss most of the scheduling activity. Also, they are left wondering what happened to the rest of the program.

RECOMMENDATION

Since it's crucial for students/teachers to understand that the numbers 1-6 operate the various days and times for the scheduler, the directions for these commands need to be carefully explained and reinforced. The direction to use the numbers to change the days/times is currently explained only once on the computer. We might consider adding one or more of the following:

1) On the screen in which the numbers are explained, add: "When you have finished scheduling Monday and Tuesday afternoon, press 2 to move to the next day."

2) When they have completed the schedule for Monday and Tuesday afternoon, a list of command options is given at the bottom of the screen. Add to these commands: "#'s 2-6 -- move to another day/time." This is probably the most straightforward means of taking care of the problem.

3) Make worksheet 1-B even more dydactic than it is: "When you have finished the schedule for Monday and Tuesday afternoon, press #'s 2-6 to move to other days/times."

4) Instructions for the scheduler can include a demonstration of movement through the schedule. Take the figure in handout 1B (bottom) as a small graphic, and have students tap through the six function keys and reverse screen for each key (i.e., a miniature version).

5) All the functions of the scheduler including "z" and "some cells blank," need to be fully explained in print (for teachers and students) and in the instruction screens.

PROBLEM

Concurrent with the scheduler problems, N=end is causing confusion. As one teacher said, "N=end should be more carefully explained. I took it to mean I was finished with the frame shown." This teacher interpreted N=end the same as most students, i.e., "finished with the frame shown." Subjects press this thinking it's the end of the frame and become quite confused when it starts checking their schedule after Monday and Tuesday. Most assumed this was as far as the program went.

RECOMMENDATION

There seem to be four possible remedies:

1) N=end is really simply the schedule checker. Perhaps it should read N=Schedule Check, which would avoid the confusion associated with the word "end".

2) Explain early in the program what the Schedule Checker is and what it does

3) Include an explanation of this command in student guide instructions.

4) If the Schedule Check is the real use of the power of a computer, then let's point it out in the guide for teachers and possibly students. Kids can use a piece of paper to draw up a schedule (if they would ever be prompted to) but the checking of the scheduled and allocated time is something that the computer does efficiently.

PROBLEM

The average length of time to complete the schedule through Monday and Tuesday afternoon was 52 minutes for the seven student groups. Also, three of the five teachers indicated they thought the computer/group work would take longer than "20-30 minutes, once or twice a week." As one teacher said, "I'm concerned that many will not finish during the average class period. . . what happens when schedule is partly done (on computer) and for some reason computer time is up for the student? Could there be a way to save any portion of what the child has completed?" It appears likely that many students will not complete the computer portion of the lesson in one class period.

RECOMMENDATION

This is a complicated issue. Perhaps we might:

1) Break the computer program into two parts (before and after the worksheets) and allow students to save their partially-completed work on disk.

2) Include a print option for the lucky few that have printers.

PROBLEM

A few groups of students were somewhat confused by the worksheets (what to do and when). In the words of one student, "There were too many pieces of confusing paper." One teacher also mentioned this as a potential source of misunderstanding.

RECOMMENDATION

1) Better integrate the worksheets with the computer program. Perhaps specify the particular worksheet: "Go to your desk and complete worksheet 1-A."

2) Also, the sheet that gives the overview of assignments is not labelled (it's the last page of the Teacher Guide). It might help to label this and refer to it in the program: "See worksheet 1-C for your assignment schedule."

3) Divide the handouts into handouts and student guides. Existing 1-A and 1B are handouts; a new, comprehensive set of instructions and a copy of the last page could become a student guide.

PROBLEM

In checking students' awareness of when assignments are due, the computer asks, "On which day should you have read your novel." All groups interpreted this to mean when they should read it, instead of when it's due.

RECOMMENDATION

Change the phrase to: "On which day is the novel due?"

PROBLEM

Some student groups wanted to spend more than 1-9 hours on fun things. For example, one group wanted to watch TV for 16 hours (which is not unrealistic over four days). They tried to enter 16, but the machine only accepted 1. They ended up with 1 hour 30 minutes when they had intended 16 hours.

RECOMMENDATION

Either explicitly state the parameter for hours (1-9) on-screen, or drop the parameter entirely.

PROBLEM

Some student groups (3 or 7) were unclear what Study 1 and Study 2 meant. Evidently, not all middle schoolers still have study halls. One teacher also said, "These are a bit fuzzy, but I assume they are study periods." These are never really explained; we just assume people will know what we mean.

RECOMMENDATION

Call them study periods. If there is not enough room to label them, explain somewhere prior to their appearance on-screen (and in the student guide) that these are in-school study periods.

PROBLEM

As they were building their schedules, two groups wondered what their time scheduled for fun things was. This is never recorded by the computer or on a worksheet. The only way to deduce this is to subtract the homework time from the total time scheduled, which does not give one a time for any individual activity (watching TV, for instance). We didn't see any groups who were clever enough to do this.

RECOMMENDATION

This is not a major problem. However, we might want to total the time spent on fun things immediately after students enter the time. Or we might allow worksheet space for students to list their fun time.

PROBLEM

Assignments - There were a few problems with some of the assignments. These include:

1) Novel - read 100 pages. Over half of the students, mostly sixth and seventh graders, indicated this is not an assignment they would likely have for one week. This surfaced as a potential problem during script testing with teachers.
2) Social Studies Project - According to one teacher, ". . . the direction given is for classwork for week and 3-4 hours out-of-class research. What is classwork? Amount of time spent in class, amount of time spent preparing for class, or both? I had trouble because this has a direct bearing on the answer on the amount of time spent." Students also found this description somewhat nebulus.
3) Map - Outline map was confused with project outline by some students.

RECOMMENDATION

1) Shorten the novel assignment to 75 pages.
2) Drop the reference to "classwork for week."
3) Drop "outline map." Make it "Map: Label rivers, cities, etc."

PROBLEM

Word Problems - There are a few problems with word choice (inappropriate words or words omitted) in the computer program. These include:

1) "Allocated time" and "scheduled time" are synonymous.
2) Going to the gym to swim.
3) In checking the awareness of when the math problems are due, if students respond correctly, computer responds: "Right, the word problems must _____ done by Wednesday." This is missing the word "be".
4) In listing the specific assignments for Social Studies outline, computer lists "Brief outline of _____ due Friday (1 page)." It's missing a word, which is "project" or "paper".

RECOMMENDATION

1) Make it "estimated time" and "scheduled time."
2) Change "gym" to "pool" or "health club."
3) Add the word "be".
4) Add word "project" or "paper", whichever is intended.

Conclusions

Although the evaluation identified a variety of concerns for each lesson, there were some encouraging findings as well. First, each lesson captured and maintained students' attention. This may well be a factor of the "neat, new gadget" effect, which the computer seems to have on many youngsters. As one teacher said, "At this point in time, kids will do anything on a computer." Regardless of the reasons, however, the programs were interesting to the target-agers. Secondly, the problems that were identified are all resolvable. Some were very minor programming errors (words missing, starting sentences with periods, etc.) Other problems were more conceptual in nature. The important point, however, is that the revisions that are currently being made to address these problems should result in the programs being strengthened.

In addition to the specific findings for each program, some lessons have been learned about evaluating this project. First, and foremost, it seems critical that evaluators spend a considerable amount of time personally observing groups of students as they work through the programs. This is an arduous and detailed task. Due to the nature of the task, using the evaluator primarily as the evaluation instrument, it seems doubtful that this particular aspect of program evaluations could be "farmed out" to consortium agencies. This does not preclude consortium agencies involvement in reviewing early forms of programs through checklists or questionnaires. However, these types of evaluations are so detailed that those who eventually report to the project team must be personally involved in collecting student data. We have also affirmed the need to subject each program from Solutions Unlimited to a rigorous evaluation with target-age students; debugging programming errors simply will not suffice for these kinds of learning materials.

Obviously, then, adequate time is being built into the developmental schedule to accommodate this kind of evaluation and the anticipated program modifications based on the findings.

APPENDIX A

Time Begin_____
Time End _____

SOLUTIONS UNLIMITED
Observation Form
Lesson #3 - Time Management

Computer	Student Observation and/or Response	Problems
- See video?		
- Many people have trouble planning for. . . .		
- Assignment calendar		
- Planned activities		
- Other "fun things" Like to do most? Second Choice? Third choice?		
- Time Spent		
- Assignments Read novel? Math Problems?		

Computer Prompt	Student Response and/or Observation	Problems
1. Vocabulary Quiz		
2. Novel		
3. Math 30		
4. Word Problem		
5. Math Quiz		
6. Outline		
7. Map		
8. Project		
9. Lab Sheet		
10. Science		
- Worksheets		
- Cursor Directions		

Computer Prompt			Student Reponse and/or Observation	Problems
Time	Monday	Tuesday		
Study 1				
Study 2				
3:30	Dentist			
4:00	Dentist			
4:30				
5:00				
5:30				

Computer Prompt	Student Response and/or Observation	Problems
- Schedule Checking		

APPENDIX B

Name _____

Subject(s) Taught _____

Grade(s) Taught _____

Home Phone _____

LESSON #1 - HW-T-S-S PROBLEM-SOLVING GUIDE

Teacher Questionnaire

1. Did you like the computer program?
   2 yes, a lot
   3 yes, a little — Graphics are a distinct plus.
   ____ no, not very much
   ____ no, not at all

2. Was the program clear and understandable?
   5 yes ____ no
   If no, please cite specific parts of the program in which the directions were not clear and understandable?

   - However, better directions are needed at the end of Disc A. Also, the very last screen of the program needs to be either eliminated or added to the introduction.
   - Wouldn't the borrower know the guitar owner was moving before she got the phone call?

3. Would your students enjoy doing this lesson on a computer?
   2 definitely 3 probably ____ probably not ____ definitely not
   Comments:
   - Most probably would, but I question general enjoyment at seventh grade level.
   - But could it be a bit more fast moving?
   - At this point in time, kids will do anything on a computer.

4. This program is probably most appropriate for students in grades (circle all that apply):

5	6	7	8	9
(4)	(5)	(4)	(2)	(2)

Comment that girl will come over and spend some time with boy before he moves is older - elem. & middle schoolers don'- say it directly to one another.

5. Was the computer lesson well-organized?
   3 yes, very well-organized
   1 yes, sort of well-organized
   ____ no, not very well-organized
   ____ no, not at all well-organized

6. Could your students easily and independently operate the computer program?
   3 yes, all of my students could easily operate the program
   2 yes, most of my students could easily operate the program
   ____ no, not many of my students could easily operate the program
   ____ no, none of my students could easily operate the program

   Comments:
   - Loading each disk needs to be emphasized to teacher so he/she can instruct students beforehand.
   - Be consistent about the use of self-pacing.

7. Does the computer program provide adequate feedback to students' responses?
   2 yes 3 no
   If no, please cite examples:
   - Several screens of quick reading with no student interaction shown.
   - In the meat and potatoes part (disks B & C). The recap of the video segment does not; could you give a one-sentence rationale for the campers' choice?
   - When asking for a step - if I put in any answer - it only reviewed steps, then cycled around. If asking students to compare their (see attached)

8. Listed below are the instructional objectives for this program. Using the following key, rate each objective according to its visibility in the computer program.

   A = clearly visible B = only slightly visible C = not visible at all

A	B	C	OBJECTIVES: Upon completion of this module, students will be able to:
5			____1. Recognize the need and value of a process for problem solving.
4	1		____2. Use the steps in the HW-T-S-S process to solve a problem.
3	2		____3. Realize that a person may recycle through any of the steps in the process during problem solving.
4		1	____4. Recognize that the HW-T-S-S process can be applied in more than one way to solve the same problem.

   Comments:
   - Steps need to be posted during lesson (near computer) so a student can get the step they know they want without worrying about spelling.
   - The student isn't allowed to make full use of the HW-T-S-S process. His/her choices are very limited. From the directions, I would think they would be involved much more in deciding which step to use and not just making choices.

9. Was the computer program instructionally effective?
   2 definitely 3 probably ___probably not ___definitely not

10. Would this program motivate your students to return to the computer?
   2 definitely 3 probably ___probably not ___definitely not

11. Listed below are the sections of the teacher guide for Lesson #1. Use the following scale to rate how important each of these sections would be to you in implementing Lesson #1.

1	2	3	4	5
Essential		Nice, but not necessary		Totally Unimportant

1.2 Introduction	2.0 Suggested activities
1 Objectives	2.6 Resource materials
1.4 Total lesson time	2.4 Student activity #1
1.2 What you'll need	2.0 Student activity #2
1.2 Summary of the video	2.0 Student activity #3
1 Summary of the computer program	2.6 Student activity #4
2 Step-by-step procedures	

12. Of the guide sections listed in question 11, which 3 would be most useful to you.

1. Intro	Obj.	Obj.	Obj	Stu. Act.
2. Step-by-Step	Tot. time	What you'll need	Wh. you'll need	Sugg. Act.
3. Act. 1&4	Summ. of comp. program	Summ. of comp. program	Sugg. Act.	S-by-S

Comments:
- other curricular demands may preclude use of suggested activities.
- just enough meat, yet not so much you don't want to read it.

13. Are student activity sheets necessary for this lesson?
   2 definitely 1 probably 2 probably not ___definitely not

14. Are the student activity sheets for this lesson appropriate for your students?
   3 definitely 2 probably ___probably not ___definitely not
   If not, which are not appropriate and why?
   #1 - good for slower students or as "filler".
   #4 - good for students needing reading reinforcement, but not for higher ability levels
   - My students range from EMR to Gifted. Activity sheets would be good for some, but not all.
   - Crossword of guitar needs to be more professionally drawn and larger on sheet.

15. Which one of the student activity sheets would you be most likely to use? Why?
- #2 word search with possibility of names listed. The research aspect appeals to me as a challenge for students.
- #1 has high student appeal.
- No preference - variety is good for different student levels.
- Improved crossword
- Scrambled story. Helps students understand problem-solving procedure.

16. Under the Total Lesson Time section of the guide, time estimates are given for the various components of this lesson. Based on your review of these materials, do these estimates seem accurate? Use the following scale to rate each section:

A. Yes, they are accurate
B. No, I think it would take longer
C. No, I don't think it would take that long

A	B	C	LESSON COMPONENTS
5			____1. Introduction and video viewing: 10 minutes
4	1		____2. Class Discussion: 5-10 minutes
4	1		____3. Computer/Class Group Work: 20-30 minutes, once or twice a week
3	1	1	____4. Wrap Up Session: 10-30 minutes

For any component which you have rated B or C, please explain why:

- I see a big problem in not being able to complete the computer lesson in one sitting.

17. The step-by-step procedures section of the guide details a recommended sequence for using this lesson. Given the structure of your classroom and school, would using the procedures described in this section create any logistical problems for you?

__1__ yes ___4___ no

If yes, please describe:
- Availability of computers could be a problem dependent upon scheduling of regular computer classes.

18. The basic purpose of a Teacher Guide is to help a teacher successfully implement a particular lesson. Do you feel this guide would help you successfully implement Lesson #1.
3 definitely 2 probably ___probably not ___definitely not

19. Do you feel you would be able to easily manage the various activities of this lesson with your classes?
5 yes ___no
If no, please explain:

20. Have you seen and/or used any other educational computer software?
2 yes, a lot 2 yes, some 1 no, not very much ___no, none at all

[If yes, answer question 21 - If no, go to question 22]

21. How would you rate this program compared to other educational computer software you've seen.
2 better than most
1 about the same as most
1 worse than most

Better visuals than most I've seen.

-Sorry, yet what I view is usually more colorful and visual. But the disk calls for a lot of student response & thinking. That's super important.

22. How would you most likely use this lesson?
4 as part of a unit on study skills, decision-making, problem solving
1 as an individual study lesson
2 as supplementary material for select students
___I probably wouldn't use it
___other (please describe)

23. What changes would you recommend for the computer program?
- The amount of print and spacing of it on screen bothers me. Also, for slower readers the reading rate may be too fast. Work on screen spacing - often too much info on one screen.
- Include more opportunities to test knowledge of problem-solving skills.
- None
- A bit slow moving
- Move paragraphs or reading to various spots on screen. (see attached)

24. What changes would you recommend for the Teacher Guide?
- None
- None
- Brevity
- Include map of all alternatives, so the teacher does not spend hours previewing disk.

25. Do you have any other comments or concerns? (use back of sheet if necessary)
- The program would be useful for study skills course, which is implemented in many schools in my area.
- The program can be adapted to fit the ability level of students.

THANK-YOU!!

7. alternatives to the computers choices, a listing side-by-side would help.

   - It would be nice to see a list of the students' alternatives whenever they are compared with the girls.

23. Grammar/punctuation

   "What is one way to _____ without a bike." Should be - bike?"

   "Who do you think _____ should call?" Should be - "Whom

   The program's approach seems to be quite an elementary one -- perhaps not challenging enough in terms of the basic problem (although I do realize you are trying to use a situation with which the greatest number can identify).

APPENDIX C

Name 33

Subject(s) Taught _____

Grade(s) Taught _____

Home Phone _____

LESSON #3 - TIME MANAGEMENT

Teacher Questionnaire

1. Did you like the computer program?
   - 1 yes, a lot
   - 3 yes, a little
   - ___ no, not very much
   - 1 no, not at all

2. Was the program clear and understandable?
   1 yes 4 no
   If no, please cite specific parts of the program in which the directions were not clear and understandable?
   - The directions are clear, but it will take a bit of practice for students to become used to moving cursor.
   - Directions for changing schedule of work assignments were confusing.
   - But when scheduling, I only worked on two days to insert information. Did I miss something?
   - Study 1 and Study 2 are a bit fuzzy, but I assume these are study periods.
   - In the directions for Social Studies project, the direction given is for classwork for week and 3-4 hours of out-of-class research. What is classwork? Amount of time spent in class, amount of time spent preparing for class or both? I had trouble because this has direct bearing on the amount of time spent.

3. Would your students enjoy doing this lesson on a computer?
   1 definitely 3 probably 1 probably not ___ definitely not
   Comments:
   - The puzzle-like quality will be a challenge to them. . .more sophisticated than Program #1 in its approach, but with good feedback.
   - Able students in grades 5 and 6. Beyond that it would probably be for students having academic problems. Poorer students may end up frustrated -- not enough prompts for less able students.

4. This program is probably most appropriate for students in grades (circle all that apply):

5	6	7	8	9
	(2)	(5)	(5)	(2)

5. Was the computer lesson well-organized?

1 yes, very well-organized
4 yes, sort of well-organized
___ no, not very well-organized
___ no, not at all well-organized

6. Could your students easily and independently operate the computer program?

___ yes, all of my students could easily operate the program
2 yes, most of my students could easily operate the program
3 no, not many of my students could easily operate the program
___ no, none of my students could easily operate the program

Comments:
- In some areas, I feel more direction should be given on the screen.
- Directions just not clearly given.
- Difficulty in knowing when and how to answer questions.

7. Does the computer program provide adequate feedback to students' responses?

2 yes 3 no

If no, please cite examples:
- I found difficulties in revising schedule. N=END should be more carefully explained. I took it to mean I was finished with the frame shown.
- Offered no response when I refused to reschedule activities. Boring in a way, since I could manually fill in the time as easily as on the computer grid.
- More feedback needed throughout scheduling process.

8. Listed below are the instructional objectives for this program. Using the following key, rate each objective according to its visibility in the computer program.

A = clearly visible B = only slightly visible C = not visible at all

A	B	C	OBJECTIVES: Upon completion of this module, students will be able to:
5			___1. Recognize the need to allocate time in order to meet assignments and manage free time.
3	2		___2. Identify problems requiring the allocation of time and other resources.
3	2		___3. Break large tasks into smaller ones and estimate time and resources needed for completion.
5			___4. Schedule tasks to meet deadlines.

Comments:
#2 - I did not get to any problems -- any reason to study -- reward/punishment effect just by planning schedule.
#4 - Need reward/punishment feedback.
-Objectives #3 and #4 are hinted, but they need to be more clearly spelled out.

9. Was the computer program instructionally effective?
1 definitely 3 probably ___probably not ___definitely not NR-1

10. Would this program motivate your students to return to the computer?
___definitely 2 probably 1 probably not 1 definitely not NR-1

11. Listed below are the sections of the teacher guide for Lesson #1. Use the following scale to rate how important each of these sections would be to you in implementing Lesson #1.

1 2 3 4 5
Essential — Nice, but not necessary — Totally Unimportant

1 2 3 4 5		1 2 3 4 5		
4	1.0 Introduction	2 1 2	2.0	Suggested activities
5	1.0 Objectives	4 1	1.2	Student activity #1A
5	1.0 Total lesson time	4 1	1.2	Student activity #1B
4 1	1.2 What you'll need	1 2 1 1	2.4	Student activity #2
3 1	1.2 Summary of the video	1 1 3	2.4	Student activity #3
4 1	1.2 Summary of the computer program	2 2 1	1.4	Student activity #4
4 1	1.2 Step-by-step procedures			

12. Of the guide sections listed in question 11, which 5 would be most useful to you.

1. Intro.	Objs.	Objs.	Objs.	Stud. Act.
2. S-by-S procedures	Summ. of Prg.	S-by-S	Sugg. Act.	S-by-S
3. Act. 1 & 4	Act. 1A & B	Tot. Les. Time	What you'll need	Sugg. Act.

Comments:
- Activities are good, but time constraints may preclude their use.
- More directions need to be given prior to student use.

13. Are student activity sheets necessary for this lesson?
3 definitely 2 probably ___probably not ___definitely not

14. Are the student activity sheets for this lesson appropriate for your students?
3 definitely 2 probably ___probably not ___definitely not
If not, which are not appropriate and why?
- Discussion of consequences of planning will be important for a teacher to do during class discussions.

15. Which one of the student activity sheets would you be most likely to use? Why?
- 1A and B are both vital to lesson
- 1A and B
- Activity 4
- #3

16. Under the Total Lesson Time section of the guide, time estimates are given for the various components of this lesson. Based on your review of these materials, do these estimates seem accurate? Use the following scale to rate each section:

A. Yes, they are accurate
B. No, I think it would take longer
C. No, I don't think it would take that long

LESSON COMPONENTS

A	B	C
4	1	
5		
2	3	
5		

___1. Introduction and discussion: 10 minutes
___2. Video Viewing and Discussion: 15-25 minutes
___3. Computer/Class Group Work: 20-30 minutes, once or twice a week
___4. Wrap Up Session: 20-45 minutes

For any component which you have rated B or C, please explain why:
- To discuss journals and introduce program, 10 minutes is not sufficient. It's not practical to have more than one sitting at the computer. Time will need to be extended. I'm concerned that many will not finish during the average class period.
- Time will depend on activity level of students

17. The step-by-step procedures section of the guide details a recommended sequence for using this lesson. Given the structure of your classroom and school, would using the procedures described in this section create any logistical problems for you?

__2__ yes __3__ no

If yes, please describe:
- Availability of computers could be a problem, depending upon scheduling of regular computer classes.
- What happens when schedule is p artly done (on computer) and for some reason computer time is up for the student. Could there be a way to save any portion of what a child has completed?

18. The basic purpose of a Teacher Guide is to help a teacher successfully implement a particular lesson. Do you feel this guide would help you successfully implement Lesson #1.
2 definitely 3 probably ___probably not ___definitely not

19. Do you feel you would be able to easily manage the various activities of this lesson with your classes?
5 yes ___no
If no, please explain:

20. Have you seen and/or used any other educational computer software?
2 yes, a lot 2 yes, some 1 no, not very much ___no, none at all

[If yes, answer question 21 - If no, go to question 22]

21. How would you rate this program compared to other educational computer software you've seen.
___ better than most
2 about the same as most
2 worse than most
NR-1

22. How would you most likely use this lesson?
2 as part of a unit on Grade 7 orientation or study skills - Study skills
1 as an individual study lesson
1 as supplementary material for select students
1 I probably wouldn't use it
1 other (please describe)
- use it to begin semester, then occasionally as students need it.

23. What changes would you recommend for the computer program?
- It just doesn't seem to have student appeal, but I'm not sure how the program could be changed. My students were not anxious to use it.
- It is dull. Liven it up with a sample student or more positive reinforcement.
- The schedule check by areas is a bit slow to move. Is it feasible just to have the entire schedule checked and not come on the screen by areas of instruction? I see the purpose - to notify the user of errors, (see

24. What changes would you recommend for the Teacher Guide? attached)
- Brevity -- too much reading -- condense info. A 2-3 minute overview with suggestions would be great
- Expand activities and activity sheets.

25. Do you have any other comments or concerns? (use back of sheet if necessary)
- I like the idea of the student building a schedule on computer, but something must be done to keep his attention.
-

(see attached)

23. but the when to correct direction needs to be more explicit.

- I put any time in and later had to go back and change this in the schedule, having to restrict my choices would help at first.

25. -Checking the schedule over was good -- but earlier it allowed me to put any answer in -- restricting the information at first would speed up the scheduling.

- Managing time is a very personal thing -- students usually develop their "own thing" that works. A computer program such as this may not help these students enough to off-set the cost of buying the program.

-One person's comments:

1) For ease of reading, I would keep the subject headings and days as is, but I would change the type of print for the actual assignments.
2) Is workschedule one or two words?
3) In a few areas at the very beginning grammar needs to be "cleaned up." When listing items, list should begin with same part of speech -- all verbs, etc.
4) Is there any way to have 1 hours read 1 hour?
5) Project outline for Social Studies reads: Brief outline of _____ due Friday 1 page. Name of outline should appear and shouldn't 1 page be placed after outline?
6) Because this program spans all geographical and economic areas, might it be better to rephrase "Going to the gym to swim," to "Going to the "pool" to swim." This way the "pool" takes care of outdoors, indoors - home, gym, Y, health clubs, schools, etc.